FLUX CREEP IN $Bi_2Sr_2CaCu_2O_{8+x}$ SINGLE CRYSTALS

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The results of a magnetic study on a $Bi_2Sr_2CaCu_2O_{8+x}$ single crystal are reported. Low field susceptibility (DC and AC), magnetization cycles and time dependent measurements have been performed.

With incresing the temperature the irreversible regime of the magnetization cycles is rapidly restricted to low fields, showing that the critical current J_C becomes strongly field dependent well below T_C. At 4.2 K the critical current in zero field, determined from the remanent magnetization by using the Bean formula for the critical state, is $J_C(//c) = 2\ 10^5\ Acm^{-2}$. The temperature dependence of J_C is satisfactorily described by the phenomenological law $J_C = J_C(0)(1 - T/T_C)^n$, with n=8.

The time decay of the zero field cooled magnetization and of the remanent magnetization has been studied at different temperatures for different magnetic fields. The time decay has been found to be logarithmic in both cases, at least at low temperatures.

At T=4.2 K for a field of 10 kOe applied parallel to the c axis, the average pinning energy, determined by using the flux creep model, is $U_O = 0.010$ eV.